

CLAIMS:

1.(USA) A method of monitoring a physiological condition of a patient by measuring at
5 least one indicator component concentration in a liquid, comprising:

providing a liquid containing at least one indicator component, the concentration
of which in said liquid being indicative of said physiological condition;

bringing said liquid into contact with a voltammetric electronic tongue, having
at least one working electrode consisting essentially of a metal or alloy selected from
10 members of any of the groups 6-12 of the periodic table, preferably groups 9-11;

applying a predefined potential pulse program to said at least one working
electrode and a counter electrode;

recording current response data caused by said potential pulse program;

performing a mathematical analysis of recorded current response data according
15 to a model based on multivariate analysis to provide a result.

2. The method of claim 1, wherein said liquid is selected from the group consisting
of whole blood, blood plasma, dialysis liquid, urine, intestinal liquids, gastric liquid.

3. The method of claim 1, wherein said liquid is dialysis liquid and the indicator
component(s) is selected from one or more of urea, β 2- microkinase, albumin, cholesterol,
20 PTH (Parathyroid Hormone), K^+ , Ca^{2+} , Creatinine.

4. The method of claim 1, wherein said at least one electrode is one or more of Pt,
25 Au, Rh, Ir or alloys thereof.

5. The method of claim 1, wherein the potential pulse program comprises potential
pulses having a duration of less than 700 ms, preferably less than 100 ms, most preferably less
than 50 ms, and suitably 25 ms or less.

6. The method of claim 5, wherein the pulses of said potential pulse program
exhibit a stepped amplitude sequence, and wherein said pulses extend from a positive to a
negative potential or vise versa during each period in the pulse train..
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7. The method of claim 6, wherein said pulse program is specific to each individual electrode.

8. The method of claim 7, wherein one electrode is Pt and the initial pulse step is from $-2V$ to $+2V$, and thereafter incrementally decreases towards zero, and optionally after a cross-over at zero V, the steps change polarity such that the pulses extend from negative to positive until a maximum of $-2V$ and $+2V$ respectively, is reached, and then back to zero.

9. A system for monitoring a physiological condition of a patient by measuring at least one indicator component concentration in a liquid, comprising:

a voltammetric sensor unit comprising at least one electrode made of a material selected from any of the groups 6-12 of the periodic table, preferably groups 9-11;

a counter electrode;

a potentiostat having a programmable pulse generator;

a processing unit for the mathematical processing of voltammetric data using a model based on multivariate analysis.

10. The system of claim 9, further comprising a reference electrode.

11. The system of claim 9, wherein said liquid is selected from the group consisting of whole blood, blood plasma, dialysis liquid, urine, intestinal liquids, gastric liquid.

12. The system of claim 11, wherein said liquid is a dialysis liquid and wherein said sensor unit is arranged in a dialysis liquid flow path after a filter unit of a dialysis apparatus.

13. The system of claim 12, comprising a further sensor unit, arranged before said filter unit.

14. The system of claim 11, wherein said liquid is blood derived from a patient and wherein said sensor unit is arranged to measure the desired component in a sample of said blood.

15. The system of claim 14, wherein said blood is sampled by continuously withdrawing blood from a patient, and wherein said sensor unit is arranged in the flow path of the blood.

16. The system of claim 9, comprising a display unit for graphically monitoring the measurements// in real-time, e.g. as a graph.

5 17. The system of claim 9, further comprising a device presenting a visual and/or audio signal representative of when a predefined result has been detected.

18. A method of detecting the presence and/or the concentration of an analyte in a liquid, comprising:

10 providing a liquid containing at least one analyte selected from the group consisting of urea, heparin, β 2- microkinase, albumin, cholesterol, PTH (Parathyroid Hormone), K^+ , Ca^{2+} , Creatinine;

bringing said liquid into contact with a voltammetric electronic tongue, having at least one working electrode consisting essentially of a metal or alloy selected from members of any of the groups 6-12 of the periodic table, preferably groups 9-11;

5 applying a predefined potential pulse program to said at least one working electrode and a counter electrode;

recording current response data caused by said potential pulse program;

20 performing a mathematical analysis of recorded current response data according to a model based on multivariate analysis to provide a result.

19. A method as claimed in claim 18, wherein said liquid is selected from a member of the group consisting of urine, intestinal liquids, gastric liquids, lymphatic liquids.